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PRE-APPEAL BRIEF REQUEST FOR REVIEW

Docket Number (Optional): Kopmeiners 4-16

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Application Number	Filed
10/047,064	1/15/02

First Named Inventor: Kopmeiners et al.

Art Unit	Examiner
2611	Freshteh N. Aghdam

Applicant requests review of the final rejection in the above-identified application No amendments are being filed with this request

This request is being filed with a notice of appeal

The review is requested for the reason(s) stated on the attached sheet(s)
Note: No more than five (5) pages may be provided

I am the

- [ ] applicant/inventor
- [ ] assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3 73(b) is enclosed (Form PTO/SB/96)
- [X] attorney or agent of record Registration number 36,597
- [ ] attorney or agent acting under 37 CFR 1 34 Registration number if acting under 37 CFR 1 34 _____

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January 12, 2007
Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required Submit multiple forms if more than one signature is required, see below*.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent Application

Applicant(s):	Kopmeiners et al.
Case:	4-16
Serial No.:	10/047,064
Filing Date:	January 15, 2002
Group:	2611
Examiner:	Freshteh N. Aghdam
Title:	Maximum Likelihood Detection Method Using a Sequence Estimation Receiver

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MEMORANDUM IN SUPPORT OF
PRE-APPEAL BRIEF REQUEST FOR REVIEW

The present invention and prior art have been summarized in Applicants' prior responses.

STATEMENT OF GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1-6 are presently pending in the above-identified patent application. The drawings were objected to under 37 CFR 1.83(a). Claim 1 was rejected under 35 U.S.C. §103(a) as being unpatentable over Piirainen (United States Patent Number 6,396,878), and further in view of Bar-David et al. (United States Patent Number 5,623,511), and claim 4 was rejected under 35 U.S.C. §103(a) as being unpatentable over Critchlow (United States Patent Number 5,276,706), and further in view of Bar-David et al. The Examiner indicated that claims 2, 3, 5, and 6 would be allowable if rewritten in independent form including all of the limitations of the base claims and any intervening claims.

ARGUMENTS

Drawings

The drawings were objected to for not showing every feature of the invention specified in the claims. In particular, the Examiner asserts that "the predetermined set of symbols and the reference symbols must be shown."

Applicants note that FIG. 2 represents a symbol. A person of ordinary skill in the art would recognize that FIG. 2 is representative of both predetermined symbols and reference

symbols. Applicants respectfully request that the objections to the drawings be withdrawn.

Independent Claims 1 and 4

Independent claim 1 is rejected under 35 U.S.C. §103(a) as being unpatentable over Piirainen, and further in view of Bar-David et al., and claim 4 is rejected under 35 U.S.C. §103(a) as being unpatentable over Critchlow, and further in view of Bar-David et al. Regarding claim 1, the Examiner asserts that Piirainen teaches generating a set of reference symbols on the basis of the predetermined set of symbols and a channel impulse response between the transmitter and the receiver; and comparing each of the successive parts of the received signal, each part having the length of a symbol, with each of the reference symbols, yielding a detected symbol for each part of the received signal (col. 13, lines 1-24; col. 16, lines 50-62). In the Response to Arguments section of the final Office Action, the Examiner asserts that "the applicant fails to provide any information as what the nature of the predetermined set of symbols is neither in specification nor in the drawings, therefore, the examiner interpreted the generated symbols from the hard bit decisions as the predetermined set of symbols."

In the text cited by the Examiner, Piirainen discloses that

> the impulse response estimate needed in the metric can be made adaptive. *The means 217 of the receiver then make hard bit decisions concerning the bit likelihood*, coming from the means 208, and/or probability, coming from at least one of the means 212 and 216. Means 221 are used for *generating symbols* ***from the hard bit decisions***. A convolution of the generated symbols and the impulse response estimate is used for generating reference samples, i.e. reference symbols, in the means 218, the samples being compared with the received symbols, i.e. the samples y_i. By means of the differences between the received samples and the reference samples, the impulse response estimate is changed to better correspond to reality and thus to produce a better bit decision. The changed impulse response H is fed to the means 201 in which it is used for forming the metric.
> (Col. 12, line 64, to col. 13, line 12; emphasis added.)

Piirainen further teaches

> wherein when an impulse response estimate is available, *received bits are used* ***for making hard bit decisions, bit decisions*** *are used for generating symbols*, said symbols and the impulse response are used for generating reference symbols, the reference symbols are compared with corresponding received symbols by applying the least square sum method, and the result obtained by the comparison of the reference symbols and the received symbols is used for controlling the metric to be used in detection
> (Col. 16, lines 50-62; emphasis added.)

Clearly, Piirainen describes a feedback system and, hence, symbols are created *a posterior*. Piirainen, however, does not disclose or suggest a ***predetermined*** *set of symbols* and, therefore, Piirainen does not disclose or suggest *comparing each of the successive parts of the received signal, each part having the length of a symbol, with each of the reference symbols,* yielding a *detected symbol* for each part of the received signal.

Regarding the Examiner's assertion that the Applicant fails to provide any information as to what the nature of the predetermined set of symbols is in neither in specification nor in the drawings, Applicants note that the present specification teaches that

> each symbol of the predetermined set comprises a sequence of chips wherein each of the chips is PSK-modulated according to a selected modulation code. An example of a symbol 8 of the predetermined set comprising eight chips C_1 up to and including C_8 is shown in figure 2.
> (Page 4, lines 12-16; emphasis added.)

Thus, contrary to the Examiner's assertion, Applicants provide information as to the "nature of the predetermined set of symbols." Independent claim 1 requires *generating a set of reference symbols on the basis of the predetermined set of symbols* and a channel impulse response between the transmitter and the receiver; and ***comparing each of the successive parts*** *of the received signal,* ***each part having the length of a symbol****, with each of the reference symbols,* ***yielding a detected symbol for each part*** *of the received signal.*

Regarding claim 4, the Examiner asserts that Critchlow discloses which symbol is a selected symbol out of a predetermined set of symbols (FIG. 1, means 36) and wherein each symbol of the predetermined set is modulated according to a modulation coding scheme (col. 5, lines 17-45; col. 7, lines 7-35), wherein the method further comprises filtering the received signal with a filter which yields a filter signal (col. 3, lines 18-41; col. 5, lines 17-45; col. 9, lines 1-7; FIG. 1: means 24). In the Response to Arguments section of the final Office Action, the Examiner asserts that Critchlow discloses comparing each of the successive parts of the filter signal (i.e., output of the matched filter 24), each part having the length of a symbol, with each of the symbols from the predetermined set of symbols yielding a detected symbol for each part of the filter signal (i.e., complex correlator; FIGS. 1 and 6; Blocks 74, 82, 84, and 86; col. 9, lines 1-7 and 45-68; col. 10, lines 1-2 and 43-47).

Applicants note that Critchlow is directed to a system and method for frequency acquisition by a mobile receiver in a cellular communication system. (See, Abstract.) Critchlow

teaches that "complex correlator 30 is used to determine the correlation of the incoming data stream out of matched filter 24 *with a known synchronization* ***pattern*** *or derivative thereof represented by block 36*." (Col. 5, lines 57-60; emphasis added.) In the text cited by the Examiner, Critchlow teaches, for example, that "if during any burst, a peak value F_{peak} exceeds the threshold, the location of the peak symbol; that is, where such peak symbol is in the string of data, is stored in memory." (Col. 10, lines 43-47.) Critchlow also teaches that, "if the input sequences of I's and Q's match the synchronization pattern, the output of the correlator will be a large value. If there is no match, the value will be low." (Col. 8, lines 63-66.) Critchlow is therefore comparing the incoming data stream to a *synchronization pattern 36* (see, FIG. 1). Thus, Critchlow does not disclose or suggest a *predetermined* ***set*** *of symbols*, and does not disclose or suggest discloses ***comparing*** *each of the successive parts of the filter signal* with ***each*** *of the symbols from the* ***predetermined set of symbols***

In addition, it should be noted that, in the context of the present invention, yielding a detected symbol means detecting the identity of the symbol that was received (see, page 1, line 21, to page 3, line 24, of the originally filed specification); Critchlow, on the other hand, is concerned with determining whether the peak value exceeds a threshold for a particular symbol. Thus, Critchlow does not disclose or suggest ***yielding a detected symbol*** *for* ***each*** *part of the filter signal*

Finally, Applicants note that Bar-David et al. was also cited by the Examiner for disclosing a digital communication system that utilizes PSK modulation, wherein each symbol comprises a sequence of chips. Applicants note that Bar-David is directed to a spread spectrum code pulse position modulated communication system. (See, Abstract.) Bar-David does not address the issues of generating a set of reference symbols on the basis of a predetermined set of symbols and a channel impulse response between a transmitter and a receiver; comparing each of successive parts of the received signal, each part having the length of a symbol, with each of the reference symbols, yielding a detected symbol for each part of the received signal, or of filtering a received signal with a filter which yields a filter signal, wherein the filter is a matched filter to the channel impulse response between a transmitter and a receiver; and comparing each of successive parts of the filter signal, each part having the length of a symbol, with each of the symbols from the predetermined set of symbols yielding a detected symbol for each part of the

filter signal.

Thus, Piirainen, Critchlow, and Bar-David, alone or in any combination, do not disclose or suggest generating a set of reference symbols on the basis of the predetermined set of symbols and a channel impulse response between the transmitter and the receiver; and comparing each of the successive parts of the received signal, each part having the length of a symbol, with each of the reference symbols, yielding a detected symbol for each part of the received signal, as required by independent claim 1, and do not disclose or suggest filtering the received signal with a filter which yields a filter signal, wherein the filter is a matched filter to the channel impulse response between the transmitter and the receiver; and comparing each of the successive parts of the filter signal, each part having the length of a symbol, with each of the symbols from the predetermined set of symbols yielding a detected symbol for each part of the filter signal, as required by independent claim 4.

Conclusion

The rejections of the cited claims under section 103 in view of Piirainen, Critchlow, and Bar-David et al., alone or in any combination, are therefore believed to be improper and should be withdrawn. The Examiner has already indicated that claims 2, 3, 5, and 6 would be allowable if rewritten in independent form including all of the limitations of the base claims and any intervening claims.

The attention of the Examiner to this matter is appreciated.

Respectfully,

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